

# LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

## Volume 5 | Technical Appendices

CFA1-6 | Euston to Ickenham

**Ecological baseline data: invertebrates and fish (EC-004-001)**

Ecology

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Department  
for Transport

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# **Volume 5: baseline report - EC-004-001**

## **Ecological baseline data (CFA 1-6)**

### **Invertebrates and fish**



# 1 Introduction

1.1.1 This document is an appendix which forms part of Volume 5 of the environmental statement (ES) for the Proposed Scheme. It details ecological baseline data collected for the following ecological aspects and species:

- Terrestrial invertebrates;
- Aquatic invertebrates;
- White clawed crayfish, and
- Fish.

1.1.2 The ecological baseline data detailed within this document relates to community forum areas (CFA):

- CFA1: Euston Station and approach;
- CFA2: Camden Town and HS1 Link;
- CFA3: Primrose Hill to Kilburn;
- CFA4: Kilburn (Brent) to Old Oak Common;
- CFA5: Northolt Corridor; and
- CFA6: South Ruislip to Ickenham

1.1.3 The document should be read in conjunction with Volume 2 (community forum area reports), Volume 3 (route wide effects assessment) and Volume 4 (off-route effects assessment).



## 2 Terrestrial invertebrates

### 2.1 Introduction

- 2.1.1 This section of the appendix presents a summary of baseline data relating to terrestrial invertebrates for the section of the Proposed Scheme that will pass through CFA<sub>1</sub> to 6 inclusive.

### 2.2 Methodology

- 2.2.1 Details of the standards for terrestrial invertebrate survey are provided in Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS) which is included as an appendix to Volume one.
- 2.2.2 Following the approach outlined in the FSMS, the requirement for detailed invertebrate surveys has been based on:
- the results of a desk study;
  - interpretation of habitats identified by aerial photography and Phase 1 survey to identify habitats which may be suitable for breeding areas; or hold a significant resource for maintenance of at least one part of an invertebrate's life cycle (eg foraging habitat, overwintering habitat for eggs/larvae etc); and
  - an invertebrate walkover scoping survey.
- 2.2.3 Desk study records relating to terrestrial invertebrates for 500 m from the Proposed Scheme were obtained from the following sources:
- Greenspace Information for Greater London (GIGL); and
  - The London Natural History Society invertebrate recorders<sup>1</sup>.
- 2.2.4 Descriptions of species are provided from a variety of natural history literature sources.
- 2.2.5 The status of species of conservation concern was taken from the Joint Nature Conservation Committee (JNCC) database<sup>2</sup> of species designations or for a number of taxa (principally spiders) from other respected sources.
- 2.2.6 The species of conservation concern used are defined as follows:
- Red Data Book (RDB) species include species which occur in fewer than 16 hectads (10km x 10km squares of the Great Britain national grid system) split into the following categories (the higher categories of Extinct, Extinct in the Wild and Critically Endangered are not relevant to this report):
    - RDB<sub>1</sub> - Endangered, a species is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future;

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<sup>1</sup> <http://www.lnhs.org.uk/Recorders.htm> first accessed on January 2013.

<sup>2</sup> <http://jncc.defra.gov.uk/page-3408> first accessed in July 2013

- RDB2 - Vulnerable, a species is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future if causal factors continue;
  - RDB3 - Rare, a species is Lower Risk when it has been evaluated but does not satisfy the criteria for any of the categories Critically Endangered. Sub-categories include Conservation Dependent, Near Threatened (NT) and Least Concern.; and
  - RDB K Insufficiently Known / Data Deficient - species for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.
- Nationally Scarce (formerly known as Nationally Notable) - species known or likely to be present within 16-100 hectads, sub-categorised into the following:
    - Na species estimated to occur within the range of 16 to 30 hectads;
    - Nb species estimated to occur within the range 31 to 100 hectads;
  - Regionally Notable, as listed on the Recorder database;
  - Nationally Local, species which while fairly common are evidently less widespread than truly common species, but also not qualifying as Nationally Scarce having been recorded from over 100, but less than 300 10 hectads; and
  - Species of Principal Importance as listed on Section 41 of the National Environment and Rural Communities Act, 2006.

2.2.7 The assessment of site value has taken account of the criteria (Table 1) presented by Colin Plant Associates (2006)<sup>3</sup>.

Table 1: Provisional criteria for site assessment based on the invertebrate fauna (from Colin Plant Associates, 2006).

Significance	Description	Criteria
International	European Important Site	Presence of a thriving population of internationally important invertebrates or containing a viable and thriving population or metapopulation of RDB1 (Endangered) species or containing viable population of metapopulation of any species protected under European legislation or containing viable areas of habitats that are threatened at the European level.
National	UK Important Site	Meeting requirements for SSSI designation for invertebrates (NCC 1989) or containing viable population or metapopulation of RDB 2 (Vulnerable) species or containing viable population or metapopulation of RDB 3 (Rare) species or containing viable population or metapopulation of any species protected under UK legislation or containing viable areas of habitats that are threatened or rare nationally.
Regional (for border sites, both regions must be taken into account)	Site with population of invertebrates or invertebrate habitats considered scarce or rare in this region of England	Habitat that is scarce or threatened in the region or which has, or could be reasonably expected to have, a viable assemblage of invertebrates that includes at least five Nationally Notable species or at least five species listed as Regionally Notable for the region of England in question in the Recorder database or a combination of

<sup>3</sup> [http://www.cieem.net/data/files/Resource\\_Library/Technical\\_Guidance\\_Series/SoSM/Colin\\_Plant\\_-\\_Invertebrates.pdf](http://www.cieem.net/data/files/Resource_Library/Technical_Guidance_Series/SoSM/Colin_Plant_-_Invertebrates.pdf) first accessed in July 2013.

Significance	Description	Criteria
		these categories amounting to five species in total.
County (for border sites, both counties must be taken into account) / Metropolitan	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the county in question	Habitat that is scarce or threatened in the county and/or which contains or is reasonably expected to contain an assemblage of invertebrates that includes viable populations of at least five Nationally Notable species or viable populations of at least five species regarded as Regionally Scarce by the county records centres and/or field club.
District / Borough	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the administrative District	A rather vague definition of habitats falling below county significance level, but which may be of greater significance than merely Local. They include sites for which Nationally Notable species in the range from 1 to 4 examples are reasonably expected but not yet necessarily recorded and where this omission is considered likely to be partly due to under-recording.
Local/Parish	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the affected and neighbouring Parishes	Habitats or species unique or of some other significance, such as of localised importance within the local area.
Low significance		Although almost no area is completely without significance these are the areas with nothing more than expected "background" populations of common species and the occasional Nationally Local species.

- 2.2.8 In addition to the assessment criteria in Table 1, professional opinion is required to interpret the criteria in the context of the habitats, assemblage of species recorded or reported to be present, and the presence of any protected or notable species. This follows the Natural England survey guidelines<sup>4</sup>, which require criteria to be modified to take account of relevant features at individual sites.
- 2.2.9 Since the creation of these assessment criteria, the concept of Nationally Notable, Red Data Book and Biodiversity Action Plan Species has been complemented, and replaced, by the list of Species of Principal Importance in England, given at Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006.
- 2.2.10 In order to facilitate a meaningful assessment using the criteria defined in Table 1, a minimum of three site visits are required. As there have only been a maximum of two survey visits, the results are consequently limited and are more in the way of a detailed snapshot of the invertebrate ecology. However, professional opinion drawing on available information have been used to draw conclusions, with any assumptions taking a cautionary basis.
- 2.2.11 The invertebrate scoping walk-over survey was undertaken from Public Rights of Way (PRoW) during April 2013. The scoping survey sought to determine whether habitats had the potential to support invertebrate assemblages of interest. The survey

<sup>4</sup> Natural England Research Report NERR005 (2007) available at <http://www.naturalengland.org.uk/publications/publications/>

focussed on land within or adjacent to the scheme of potential interest for invertebrates.

- 2.2.12 Sampling methodology during survey visits followed those of Colin Plant Associates but were limited to direct observation and active sampling using sweep nets, beating trays and a suction sampler. Other passive sampling techniques such as pitfall trapping and Malaise trapping were impractical because these techniques require setting up the equipment followed by collection, access for which was not guaranteed due to on-going access restrictions.
- 2.2.13 Insufficient data has been recorded from the sites during 2013 to undertake any meaningful statistical analysis, due to the small size of the datasets. Therefore, ISIS, or other indices which can be used in site assessments with regards to invertebrates, has not been used and the assessment has instead had a greater reliance on interpretation and professional judgement.

## 2.3 Deviations, constraints and limitations

- 2.3.1 All sites which were scoped from PRoW were to some extent constrained by only partial visibility to some or all of the habitats. However it is considered that the partial visibility did not affect the confidence in the findings of the scoping survey, as sufficient information was gathered to inform the likely need for further surveys.
- 2.3.2 The number of visits to each site was intended to be three but curtailed in most instances by the completion timetable and poor weather. The sites considered likely to be of greater quality were surveyed on two occasions. While formal guidelines<sup>5</sup>, recommend a minimum of five visits, they also make it clear that the actual input can be varied by the expert entomologist to take account of factors such as habitat and weather. For the sites within CFA1 - 6, a total of three visits is considered adequate for the required level of assessment in accordance with the criteria in Table 1, due to the habitats identified and their likely level of invertebrate interest, albeit additional species of interest may be recorded with additional visits and also at other times of year.
- 2.3.3 Weather conditions constrained the surveys. 2012 was a particularly wet and cold year<sup>6</sup> on average and overnight low temperatures resulted in a significant depression in numbers of invertebrate numbers and absence of some species. Similar conditions were experienced during the surveys in 2013 and it is likely that this resulted in late emergence of some species. As survey effort was not adjusted to take account of increased scarcity of invertebrates, the results should be interpreted in this context. It is considered that the data nevertheless provide a good representation of the species present, and allow an objective assessment of site value.
- 2.3.4 Limitations to the techniques employed, (as described at section 1.2.11) will result in some species groups were under-recorded and the number of invertebrates in the samples is reduced. However, all sites have been affected equally by this constraint

<sup>5</sup> English Nature (2005) now available on the web site of their successor organisation, Natural England

<sup>6</sup> The Meteorological Office (London) has formally declared 2012 as having Britain's coldest spring for 50 years (the fifth coldest and fifth wettest since records began).

and so the results are fully comparable between sites. Overall, the samples that have been obtained are considered sufficient for the purposes of the required assessment.

- 2.3.5 Survey locations identified as likely to require direct surveys but where access was not permitted are presented in Table 2. At these sites assessment has relied on desk study information and has adopted a precautionary approach when describing the interest of the site

Table 2: Summary of invertebrate survey locations where no access was available for field surveys

Survey site name	OS centroid grid reference	Description of proposed survey location	CFA number	Approximate distance from the Proposed Scheme (m) and orientation
Rail land between York Way, Islington and Primrose Hill Road, Camden (HS1 Link)	TQ292841	Variable areas along existing railway tracks including: ruderal herbage on steep embankment down to the railway tracks; narrow strips of ballast and made ground with very sparse ruderal flora; and ruderal grassland, significant patches of scrub and elements of the open mosaic ruderal habitat	2	Within
Adelaide Local Nature Reserve (LNR)	TQ276843	Grassland, scrub and woodland	3	Adjacent
Wormwood Scrubs Embankment	TQ219819	Scrub-dominated embankment	4	Adjacent
Little Wormwood Scrubs	TQ229821	secondary woodland, scrub and grassland	4	Within
Wormwood Scrubs	TQ223817	secondary woodland, plantation scrub and grassland	4	Within
Acton Railside SBI	TQ211817	scrub, ruderal vegetation and grassland	4	Within
Guinness Ltd land (Guinness Mounds)	TQ189825	scrub, ruderal vegetation and grassland	4	Within
Greenpark Way Shaft Location	TQ155837	scrub, ruderal vegetation and grassland	5	Within
Land south of Carr Road	TQ141842	scrub, trees, ruderal vegetation, grassland and reedbed /swamp adjoining to the south of an area of allotments and to the north of the Grand Union Canal	5	Within
Ruislip Shaft Location (Arla Dairy)	TQ108856	scrub, ruderal vegetation and grassland and bare ground / ephemeral vegetation	6	Within
Newyears Green Covert	TQ064875	Small area of woodland and plantation and adjacent fields	6	Within
Fields to the south-east and south-west of Bayhurst Wood	TQ071884	Agricultural land including hedgerows and ponds adjoining Bayhurst Wood, an ancient woodland.	6	Within

- 2.3.6 Specific local methodological deviations from the FSMS, and the areas to which any such deviations applied are as follows:

- River Pinn Corridor (CFA6); surveying and sampling of the marginal vegetation alongside the river itself was not undertaken, as health and safety requirements limited the practicalities of surveying along the water's edge. Hence the riparian invertebrate fauna is likely to be under-represented. However, it is considered that the data nevertheless provide a good representation of the species present, and is sufficient to allow an objective assessment of site value.
- PRoW north-west of Breakspear Road South (CFA6); dead wood was actively searched. This included looking under loose bark and breaking up soft, rotten timber by hand. However, sampling of dead wood and associated saproxylic features is necessarily destructive and so was limited to representative examinations. The examinations are considered to provide a good representation of the species present, and allow an objective assessment of site value.
- Gatemead Farm (CFA6); for health and safety reasons, surveys in fields in which cattle including bulls were present could not survey as usual, due to the need to watch the cattle.. However, it is considered that the data nevertheless provide a good representation of the species present, and allow an objective assessment of site value.
- Rail land between Breakspear Road South and Harvil Road and Copthall Covert (CFA6); dense vegetation including bramble rendered some areas inaccessible for survey. However, these areas were small and their marginal zones were easily accessed. Consequently, there was no adverse effect on the survey results.

2.3.7 Given the limitations of the survey work undertaken, any assumptions made in the absence of sufficient data have been conservative, such that, for example, if a site is considered to be between district/ borough or country/ metropolitan in terms of the conservation interest of the invertebrate assemblage, it is conservatively assumed to be of the greater conservation interest.

## 2.4 Baseline

2.4.1 Table 3 provides a summary of those sites that were subject to initial scoping surveys, and were found not to warrant further detailed survey.

Table 3: Sites scoped out of requirement for further terrestrial invertebrate survey

Ecology survey code	Survey site/location	OS grid reference	Description of proposed site and rationale for scoping out requirement for further survey	Survey date	CFA
010-IT1-000001	St James Garden	TQ293826	The site is an urban park, dominated by mown grass lawns and non-native trees and thus having no particular potential to support invertebrate populations.	23 – 25 April 2013	1
010-IT1-001001	Grand Union Canal (Camden)	TQ288841	The limited views available indicated the canal does not present any zone of marginal or emergent vegetation and that the towpath is variously un-vegetated or dominated by regularly mown grass.	23 – 25 April 2013	2

Ecology survey code	Survey site/location	OS grid reference	Description of proposed site and rationale for scoping out requirement for further survey	Survey date	CFA
			Nevertheless, to ensure that nothing had been overlooked a single survey visit was undertaken.		
010-IT1-001002	Network Rail land between Euston Road A501 and Gloucester Avenue, Camden	TQ 297 837 to TQ 286 837	Limited viewing from bridges suggests they are unlikely to be of raised invertebrate interest.	23 – 25 April 2013	3
010-IT1-008001	Grand Union Canal (Old Oak Common)	TQ223822	Partial view from bridges / PRow indicated a lack of habitats likely to be of interest to invertebrates and thus this area is considered unlikely to be of raised invertebrate interest. Nevertheless, to ensure that nothing had been overlooked a single survey visit was undertaken.	23 – 25 April 2013	4
010-IT1-009001	Atlas Road Superstore construction area	TQ212825	Built area – no invertebrate interest.	23 – 25 April 2013	4
010-IT1-010001	Acton Wells construction area	TQ208820	Built area – no invertebrate interest.	23 – 25 April 2013	4
010-IT1-008002	Old Oak Common Depot	TQ 227 822 to TQ 214 818	Partial view from bridges / PRow indicated a lack of habitats likely to be of interest to invertebrates and thus this area is considered unlikely to be of raised invertebrate interest.	23 – 25 April 2013	4

2.4.2 The locations where survey(s) for terrestrial invertebrates were undertaken is presented in Table 4. This information is cross referenced to the accompanying map series EC-11.

Table 4 Summary of terrestrial invertebrate field surveys undertaken

Survey site name	Ecology survey code	Centroid OS Grid Reference	Habitat types included in survey	Survey date(s)	CFA number	Approximate distance from the Proposed Scheme (m) and orientation
Grand Union Canal (Camden)	010-IT1-001001	TQ28W	Canal towpath comprising made ground and amenity grassland and ornamental shrubbery	5 July 2013	2	Adjacent to the Proposed Scheme
Grand Union Canal (Old Oak Common)	010-IT1-008001	TQ28G	Canal towpath comprising made ground and amenity grassland and bordered by ornamental shrubbery, scrub and trees.	5 July 2013	4	Adjacent to the Proposed Scheme
Kensal Green Cemetery	010-IT1-007001	TQ 2300 8255	Amenity grassland and mature trees	13 May 2013 8 July 2013	4	Within the Proposed Scheme
St Marys RC Cemetery	010-IT1-007002	TQ 2300 8255	Amenity grassland and mature trees	13 May 2013 8 July 2013	4	Within the Proposed Scheme
Network Rail Land within 250m of the Hanger Lane vent shaft, Ealing	010-IT1-012001	TQ182827	Grassland, scattered scrub ruderal and bare ground with railway ballast	10 July 2013	5	Within the Proposed Scheme
Perivale Wood (grassland only)	010-IT1-015001	TQ 1588 8360	Grassland, adjacent to scrub, ponds and deciduous woodland	14 May 2013 09 July 2013	5	Adjacent to the Proposed Scheme
Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	010-IT1-015002	TQ1583	Grassland, scattered scrub ruderal and bare ground with railway ballast	20 May 2013 10 July 2013	5	Within the Proposed Scheme
Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	010-IT1-017001	TQ1384	Scrub, ruderal and bare ground with railway ballast	20 May 2013 10 July 2013	5	Within the Proposed Scheme
Network Rail Land within 250m of the South Ruislip vent shaft, Hillingdon	010-IT1-020001	TQ107856	Grassland, scattered scrub ruderal and bare ground with railway ballast	11 July 2013	6	Within the Proposed Scheme
Gatemead Farm	010-IT1-024001	TQ072 873	Hedgerows, agricultural grassland	8 May 2013 2 July 2013	6	Within the Proposed Scheme



Public Right of Way north-west of Breakspear Road South	010-IT1-024002	TQ 0710 8740	Wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	8 May 2013 2 July 2013	6	Within the Proposed Scheme
Network Rail Land between Ickenham Road and Breakspear Road South, Hillingdon	010-IT1-023001	TQ0787	Scrub, woodland and an area of felled woodland.	21 May 2013 11 July 2013	6	Within the Proposed Scheme
River Pinn corridor	010-IT1-024003	TQ 0750 8725	River, river banks grassland trees and scrub.	9 May 2013 3 July 2013	6	Within the Proposed Scheme
Land to the south-east side of Breakspear Road South	010-IT1-024004	TQ 0725 8715	Flower-rich grassland, hedgerows and adjacent wooded embankment	10 May 2013 2 July 2013	6	Within the Proposed Scheme
Copthall Covert and adjacent agricultural land	010-IT1-025001	TQ065871	Deciduous woodland, hedgerows, agricultural land	11-12 June 2013 12 July 2013	6	Within the Proposed Scheme
Network Rail Land between Breakspear Rd South and Harvil Road, Hillingdon	010-IT1-025002	TQ0687	Scrub, woodland and ruderal vegetation	21 May 2013	6	Within the Proposed Scheme
Highway Farm, Newyears Green Covert	010-IT1-025003	TQ0687	Hedgerows, agricultural grassland	12 July 2013	6	Within the Proposed Scheme
PRoW at Ickenham Green, Mad Field Covert and playing fields	010-IT1-024005	TQ0786	Amenity grassland, trees, scrub ruderal vegetation, woodland	3 July 2013	6	Adjacent to the Proposed Scheme

2.4.3 Table 5 provides a summary of protected and/or notable invertebrate species identified within CFA1 to 6 inclusive. (No notable invertebrate were recorded during field surveys in CFA1 or 3).

Table 5: Protected and/or notable invertebrate species identified during terrestrial invertebrate survey in CFA1- 6 inclusive

Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
010-IT1-001001	<i>Philodromus albidus</i>	NS(Nb)	Grand Union Canal (Camden)	TQ28W	5 July 2013	Canal towpath comprising made ground and amenity grassland and ornamental shrubbery	2
010-IT1-008001	<i>Tyria jacobaeae</i>	BAP	Grand Union Canal (Old Oak Common)	TQ28G	5 July 2013	Canal towpath comprising made ground and amenity grassland and bordered by ornamental shrubbery, scrub and trees.	
010-IT1-007001	<i>Nigma walckenaeri</i>	NS(Nb)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Longitarsus parvulus</i>	NS(Na)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Hippodamia variegata</i>	NS(Nb)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Trichosirocalus barnevillei</i>	NS(Nb)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Meligethes fulvipes</i>	NS(Nb)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Chlamydatus evanescens</i>	RDB3	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007001	<i>Dichroscytus gustavi</i>	NS(Nb)	Kensal Green Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-	<i>Lygus pratensis</i>	RDB3	Kensal Green Cemetery	TQ 2300 8255	13 May 2013	Amenity grassland and mature trees	4

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Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
007001					8 July 2013		
010-IT1-007002	<i>Trichosirocalus barnevillei</i>	NS(Nb)	St Mary's Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007002	<i>Chlamydatus evanescens</i>	RDB3	St Mary's Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-007002	<i>Ponera coarctata</i>	NS(Nb)	St Mary's Cemetery	TQ 2300 8255	13 May 2013 8 July 2013	Amenity grassland and mature trees	4
010-IT1-015002	<i>Gymnetron (Rhinusa) collinum</i>	NS(Na)	Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	TQ1583	20 May 2013 10 July 2013	Grassland, scattered scrub ruderal and bare ground with railway ballast	5
010-IT1-015002	<i>Stictopleurus punctatonervosus</i>	RDB1	Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	TQ1583	20 May 2013 10 July 2013	Grassland, scattered scrub ruderal and bare ground with railway ballast	5
010-IT1-015002	<i>Trigonocranus emmeae</i>	NS(Nb)	Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	TQ1583	20 May 2013 10 July 2013	Grassland, scattered scrub ruderal and bare ground with railway ballast	5
010-IT1-015002	<i>Asiraca clavicornis</i>	NS(Nb)	Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	TQ1583	20 May 2013 10 July 2013	Grassland, scattered scrub ruderal and bare ground with railway ballast	5
010-IT1-015002	<i>Conocephalus discolor</i>	NS(Na)	Network Rail Land within 250m of the Greenpark Way vent shaft, Ealing	TQ1583	20 May 2013 10 July 2013	Grassland, scattered scrub ruderal and bare ground with railway ballast	5
010-IT1-017001	<i>Stictopleurus punctatonervosus</i>	RDB1	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5

Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
010-IT1-017001	<i>Trigonocranus emmeae</i>	NS(Nb)	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5
010-IT1-017001	<i>Asiraca clavicornis</i>	NS(Nb)	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5
010-IT1-017001	<i>Coenonympha pamphilus</i>	NT	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5
010-IT1-017001	<i>Tyria jacobaeae</i>	BAP(R)	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5
010-IT1-017001	<i>Calophasia lunula</i>	RDB3	Network Rail Land within 250m of the Mandeville Rd vent shaft, Ealing	TQ1384	20 May 2013 10 July 2013	Scrub, ruderal and bare ground with railway ballast	5
010-IT1-023001	<i>Tephritis divisa</i>	RDB K	Network Rail Land between Ickenham Road and Breakspear Road South, Hillingdon	TQ0787	21 May 2013 11 July 2013	Scrub, woodland and an area of felled woodland	6
010-IT1-023001	<i>Stictopleurus punctatonervosus</i>	RDB1	Network Rail Land between Ickenham Road and Breakspear Road South, Hillingdon	TQ0787	21 May 2013 11 July 2013	Scrub, woodland and an area of felled woodland	6
010-IT1-023001	<i>Calophasia lunula</i>	RDB3	Network Rail Land between Ickenham Road and Breakspear Road South, Hillingdon	TQ0787	21 May 2013 11 July 2013	Scrub, woodland and an area of felled woodland	6
010-IT1-	<i>Acupalpus exiguus</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013	River, river banks grassland trees and scrub.	6

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Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
024003					3 July 2013		
010-IT1-024003	<i>Anthracus consputus</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013 3 July 2013	River, river banks grassland trees and scrub.	6
010-IT1-024003	<i>Phytoecia cylindrica</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013 3 July 2013	River, river banks grassland trees and scrub.	6
010-IT1-024003	<i>Orsodacne humeralis</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013 3 July 2013	River, river banks grassland trees and scrub.	6
010-IT1-024003	<i>Stenus pusillus</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013 3 July 2013	River, river banks grassland trees and scrub.	6
010-IT1-024003	<i>Halidamia affinis</i>	NS (Nb)	River Pinn Corridor	TQ 0750 8725	9 May 2013 3 July 2013	River, river banks grassland trees and scrub.	6
010-IT1-024002	<i>Nephus quadrimaculatus</i>	RDB2	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Rhyzobius chrysomeloides</i>	NS (Na)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Ceutorhynchus constrictus</i>	NS (Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Glocianus punctiger</i>	NS(Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6

Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
010-IT1-024002	<i>Zacladus exiguus</i>	NS(Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Ischnomera cyanea</i>	NS(Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Stenus lustrator</i>	NS(Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Metrioptera roeselii</i>	NS(Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	wooded footpath with flower rich margins and remnants of ditch-and-bank topped with mature trees	6
010-IT1-024002	<i>Involvulus caeruleus</i>	NS (Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	attacks leaves of Prunus species	6
010-IT1-024002	<i>Kissophagus hederæ</i>	NS (Nb)	Public Right of Way north-west of Breakspear Road South	TQ 0710 8740	8 May 2013 2 July 2013	a bark beetle - larva feeds in dead ivy wood	6
010-IT1-024001	<i>Nephus quadrimaculatus</i>	RDB <sub>2</sub>	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024001	<i>Ceutorhynchus constrictus</i>	NS(Nb)	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024001	<i>Kisophagus hederæ</i>	NS(Nb)	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-	<i>Coenonympha pamphilus</i>	NT	Gatemead Farm	TQ 072, 872	8 May 2013	Hedgerows, agricultural grassland	6

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Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
024001					2 July 2013		
010-IT1-024001	<i>Stictopleurus punctatonervosus</i>	RDB1	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024001	<i>Tyria jacobaeae</i>	BAP(R)	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024001	<i>Calophasia lunula</i>	RDB3	Gatemead Farm	TQ 072, 872	8 May 2013 2 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024004	<i>Ophonus ardosiacus</i>	NS(Nb)	Land to the south-east of Breakspear Road South	TQ 0725 8715	10 May 2013 2 July 2013	Flower-rich grassland, hedgerows and adjacent wooded embankment	6
010-IT1-024004	<i>Glocianus punctiger</i>	NS(Nb)	Land to the south-east of Breakspear Road South	TQ 0725 8715	10 May 2013 2 July 2013	Flower-rich grassland, hedgerows and adjacent wooded embankment	6
010-IT1-024004	<i>Zacladus exiguus</i>	NS(Nb)	Land to the south-east of Breakspear Road South	TQ 0725 8715	10 May 2013 2 July 2013	Flower-rich grassland, hedgerows and adjacent wooded embankment	6
010-IT1-024004	<i>Ischnomera cyanea</i>	NS(Nb)	Land to the south-east of Breakspear Road South	TQ 0725 8715	10 May 2013 2 July 2013	Flower-rich grassland, hedgerows and adjacent wooded embankment	6
010-IT1-024004	<i>Stenus lustrator</i>	NS(Nb)	Land to the south-east of Breakspear Road South	TQ 0725 8715	10 May 2013 2 July 2013	Flower-rich grassland, hedgerows and adjacent wooded embankment	6
010-IT1-025001	<i>Zilla diodia</i>	NS(Nb)	Copthall Covert and adjacent agricultural land	TQ065871	11-12 June 2013 12 July 2013	Deciduous woodland, hedgerows, agricultural land	6

Ecology survey code	Latin name	Status	Survey site/location	OS grid reference	Date(s)	Habitat	CFA
010-IT1-025001	<i>Ballus chalybeius</i>	NS(Nb)	Copthall Covert and adjacent agricultural land	TQ065871	11-12 June 2013 12 July 2013	Deciduous woodland, hedgerows, agricultural land	6
010-IT1-025003	<i>Volucella zonaria</i>	NS(N)	Highway Farm,	TQ0687	12 July 2013	Hedgerows, agricultural grassland	6
010-IT1-025003	<i>Tyria jacobaeae</i>	BAP(R)	Highway Farm,	TQ0687	12 July 2013	Hedgerows, agricultural grassland	6
010-IT1-025003	<i>Metrioptera roeselii</i>	NS(Nb)	Highway Farm	TQ0687	12 July 2013	Hedgerows, agricultural grassland	6
010-IT1-024005	<i>Philodromus albidus</i>	NS(Nb)	PRoW at Ickenham Green, Mad Field Covert and playing fields	TQ0786	3 July 2013	Amenity grassland, trees, scrub ruderal vegetation, woodland	6





## CFA<sub>1</sub>

### CFA 1 Summary

- 2.4.4 Desk study and scoping surveys from PRow identified only habitats of low quality for invertebrates and the invertebrate assemblage at these sites and other habitats in the area is considered to be of no more than low quality with nothing more than expected “background” populations of common species typical of the habitats present.

## CFA<sub>2</sub>

### CFA 2 Summary

- 2.4.5 Desk study, scoping surveys from PRow and a single survey visit at the Grand Union Canal identified only habitats of low quality for invertebrates for the majority of this section of the Proposed Scheme.
- 2.4.6 At North Line at York Way SBI, scoping surveys from PRow recorded a variety of habitats that include ruderal grassland, extensive patches of scrub and elements of the open mosaic ruderal component. This variety of habitats is likely to support a raised invertebrate biodiversity compared to expected “background” populations and may support an invertebrate assemblage of nature conservation interest in the local area.
- 2.4.7 Individually areas of railside habitats are of low nature conservation interest, however collectively they form a movement corridor and habitat feature likely to be important to invertebrate populations across this area of London.

## CFA<sub>3</sub>

### CFA 3 Summary

- 2.4.8 Desk study indicates Adelaide LNR adjacent to the Proposed Scheme and Chalk Farm Embankment and Adelaide Nature Reserve Site of Borough Importance Grade 1 (SBI.1) within the Proposed Scheme include grassland areas that are mixed with areas of tall ruderal perennial herbs and scattered scrub. Together these habitats create a mosaic of habitats that are likely to be more important for invertebrates in comparison with most other open areas in the vicinity. Desk study data available for these sites include a survey report dated 2006<sup>7</sup>. A review of aerial photography and knowledge of the continued management of the site permit the assumption that the site is largely unchanged and so still may support a similar species assemblage species. Notable species recorded during 2006 included: *Mordellistena acuticollis* (RDBK), *Longitarsus parvulus* (NS(Na)), *Metrioptera roeselii* (NS(Nb)), *Chrysolina violacea* (NS(Nb)), *Raglius alboacuminatus* (NS(Nb)), *Chorisops nagatomii* (NS (N)), *Hylaeus signatus* (NS(Nb)), *Volucella zonaria* (NS(N)), *Volucella inanis* (NS(N)), *Coenonympha pamphilus* (NT), *Scotopteryx chenopodiata* (BAP(R)) and *Tyria jacobaeae* (BAP(R)).
- 2.4.9 Desk study indicated that Adelaide LNR and Chalk Farm Embankment and Adelaide Nature Reserve SBI.1 support a wide range of invertebrates supported by multiple microhabitat features. This invertebrate community is considered to be of high nature conservation interest due to the range of species present including protected and

<sup>7</sup> Colin Plant Associates, 2006 (pers. comm.)

notable species, the variety within the habitats present and the fact that the site connects physically with adjacent areas of railside habitats.

- 2.4.10 The remainder of the habitats within this CFA are considered to support an invertebrate assemblage of low nature conservation interest.

#### CFA<sub>4</sub>

##### Notable / Protected Species Recorded

- 2.4.11 Field surveys at St Mary's RC Cemetery recorded 35 species, three of which are notable: *Trichosirocalus barnevillei* (NS(Nb)), *Chlamydatius evanescens* (RDB<sub>3</sub>), *Ponera coarctata* (NS(Nb)).
- 2.4.12 Field surveys at Kensal Green Cemetery recorded 192 invertebrate species, eight of which were of notable (above local) interest: *Nigma walckenaeri* (NS(Nb)), *Longitarsus parvulus* (NS(Na)), *Hippodamia variegata* (NS(Nb)), *Trichosirocalus barnevillei* (NS(Nb)), *Meligethes fulvipes* (NS(Nb)), *Chlamydatius evanescens* (RDB<sub>3</sub>), *Dichroscytus gustavi* (NS(Nb)), *Lygus pratensis* (RDB<sub>3</sub>).

##### CFA 4 Summary

- 2.4.13 The desk study did not return any specific records of invertebrates which added to the knowledge of the invertebrate populations in CFA<sub>4</sub>.
- 2.4.14 Desk study, scoping surveys from PRow and a single survey visit at the Grand Union Canal identified only habitats of low quality for invertebrates for the majority of this section of the Proposed Scheme.
- 2.4.15 The areas of railway land at Old Oak Common viewed from PRow are considered to be of low conservation interest for invertebrates, but collectively with the wider rail land they form a movement corridor and habitat feature likely to be important to invertebrate populations across this area of London.
- 2.4.16 Three species of conservation significance were recorded during the surveys at St Mary's Cemetery however a low number of species were recorded overall. The quality of habitats is considered to be low for invertebrates.
- 2.4.17 More species were recorded during the surveys at Kensal Green Cemetery which is considered to be of conservation interest. The plant bug *Lygus pratensis* is currently listed in Category three of the Red Data Book and is traditionally regarded as a part of the woodland fauna. However, in reality it has become a widespread species that is expected on most post-industrial sites along with the bug *Chlamydatius evanescens*, which is also currently listed as Nationally Rare.
- 2.4.18 Wormwoods Scrubs Park and Little Wormwood Scrubs comprise a range of woodland, scrub and grassland habitats which are known to support an invertebrate assemblage of conservation interest within London. Access was not permitted to enable further detailed surveys
- 2.4.19 The remainder of the habitats in this area are considered to support an invertebrate assemblage of low nature conservation interest.

CFA<sub>5</sub>**Notable / Protected Species Recorded**

- 2.4.20 Field surveys carried out at Rail land at Greenpark Way shaft location recorded 97 records, five of which were of more than local interest: *Gymnetron (Rhinusa) collinum* (NS(Na)), *Stictopleurus punctatonervosus* (RDB<sub>1</sub>), *Trigonocranus emmeae* (NS(Nb)), *Asiraca clavicornis* (NS(Nb)), *Conocephalus discolour* (NS(Na)).
- 2.4.21 Field surveys carried out at Perivale Wood (grassland and scrub areas only), recorded 25 invertebrate species, none of which were of more than local interest.
- 2.4.22 Field surveys carried out on the rail land adjacent to Badminton Close /Mandeville Road vent shaft location recorded 80 species including five of notable interest: *Stictopleurus punctatonervosus* (RDB<sub>1</sub>), *Trigonocranus emmeae* (NS(Nb)), *Asiraca clavicornis* (NS(Nb)), *Coenonympha pamphilus* (NT), *Calophasia lunula* (RDB<sub>3</sub>), plus one BAP species *Tyria jacobaeae* (BAP(R)).

**CFA 5 Summary**

- 2.4.23 Records of the protected / notable species returned from GiGL included woodland species such as stag beetle (*Lucanus cervus*) from Perivale Wood. This species requires rotting deadwood left undisturbed for sufficient time for the grubs to mature, up to seven years<sup>8</sup> which is considered unlikely to be found in the relatively immature railside wooded.
- 2.4.24 The desk study did not return any other specific records of invertebrates which added to the knowledge of the invertebrate populations in CFA<sub>5</sub>.
- 2.4.25 Desk study indicates that the main invertebrate species of interest at Perivale Wood LNR are associated with the woodland. Whilst the woodland edge habitats and grassland south of the LNR plays a role in maintaining the invertebrate interest across the site as a whole, individually the invertebrate assemblage in the grassland is likely to be lower.
- 2.4.26 The areas of railway corridor at Rockware, and Badminton Close/Mandeville Road shaft locations individually are of low nature conservation interest, but collectively with the wider rail land they form a movement corridor and habitat feature likely to be important to invertebrate populations across this area of London.
- 2.4.27 Views from the existing railway line and interpretation of aerial photography indicate that land south of Carr Road, Ealing comprises habitats likely to support an invertebrate assemblage of conservation interest. Habitats including reed swamp, ditches, woodland, scrub and grassland in close proximity are rare within London. These habitats are known to support locally uncommon species of conservation interest, and due to lack of access it is assumed this area may support species of conservation interest.
- 2.4.28 The remainder of the habitats in this area are considered to support an invertebrate assemblage of low nature conservation interest.

<sup>8</sup> [http://www.lbp.org.uk/downloads/Publications/Management/stag\\_advice.pdf](http://www.lbp.org.uk/downloads/Publications/Management/stag_advice.pdf)

## CFA6

**Notable / Protected Species Recorded**

- 2.4.29 Field surveys undertaken on the rail land between Ickenham Road and Breakspear Road South, recorded 45 invertebrate species including three of notable interest: *Tephritis divisa* (RDB K), *Stictopleurus punctatonervosus* (RDB<sub>1</sub>), *Calophasia lunula* (RDB<sub>3</sub>).
- 2.4.30 Field surveys undertaken along the River Pinn Corridor in May 2013 recorded 149 records including four of notable interest: *Acupalpus exiguus* ((NS(Nb)), *Anthracus (Acupalpus) consputus* (NS(Nb)), *Phytoecia cylindrical* (NS(Nb)), *Orsodacne humeralis* (NS(Nb)).
- 2.4.31 Field surveys undertaken along the PRoW north-west of Breakspear Road South in May 2013 recorded 155 species, including six of notable interest (NS(Nb)) *Harpalus (Ophonus) ardosiacus*, *Glocianus punctiger*, *Zacladus exiguus*, *Ischnomera cyanea*, *Stenus lustrator*, *Metrioptera roeselii*.
- 2.4.32 Field surveys undertaken at Gatemead Farm identified 128 records including six notable: *Calophasia lunula* (RDB<sub>3</sub>), *Coenonympha pamphilus* (NT), *Stictopleurus punctatonervosus* (RDB<sub>1</sub>), *Kisophagus hederæ* (NS(Nb)), *Ceutorhynchus constrictus* (NS(Nb)), *Nephus quadrimaculatus* (RDB<sub>2</sub>), plus one BAP species: *Tyria jacobaeae* (BAP(R)).
- 2.4.33 Field surveys undertaken in the two fields 'Land on the east side of Breakspear Road South' recorded 186 species, five of notable interest: *Stenus lustrator* (NS(Nb)), *Ophonus ardosiacus* (NS(Nb)), *Ischnomera cyanea* NS(Nb)), *Zacladus exiguus* (NS(Nb)), *Glocianus punctiger* NS(Nb)).
- 2.4.34 Field surveys carried out at Copthall Covert identified 24 invertebrate species including two of notable importance: *Zilla diodia* (NS(Nb)), *Ballus chalybeius* (NS(Nb)).
- 2.4.35 Field surveys at Highway Farm recorded 99 invertebrate species of which two: *Volucella zonaria* (NS(N)) and *Metrioptera roeselii* (NS(Nb)). There was also one BAP species: *Tyria jacobaeae* (BAP(R)).
- 2.4.36 Field surveys carried out at Ickenham Green, Mad Field Covert recorded 10 species, one of which was of notable interest: *Philodromus albidus* (NS(Nb)).

**CFA 6 Summary**

- 2.4.37 The desk study did not return any specific records of invertebrates which added to the existing knowledge of the invertebrate populations in CFA6.
- 2.4.38 The River Pinn corridor includes areas of unmanaged habitats that, within the Metropolitan London area, are of high quality for terrestrial invertebrates associated with riparian vegetation. Species recorded during survey include *Anthracus consputus*, *Phytoecia cylindrica* and *Orsodacne humeralis* which are of conservation interest as Nationally Scarce (Nb) species. It is considered highly likely that additional survey visits would have revealed the presence of further species of conservation interest. As part of a wider green corridor in this area of London this site is considered to be of high nature conservation interest for invertebrates.

- 2.4.39 The PRoW north-west of Breakspear Road South includes a number of micro-habitats in a mosaic of high quality for invertebrates. Six Nationally Scarce species were recorded during the surveys. It is considered likely that additional survey visits would have revealed the presence of further species of conservation interest. This site is considered to be of high nature conservation interest and the invertebrate fauna of this area contributes significantly to the wider area.
- 2.4.40 The areas of railway corridor at between Ickenham Road and Breakspear Road South support a number of species including some of local conservation interest. Collectively within the wider rail land they form a movement corridor and habitat feature likely to be important to invertebrate populations across this area of London.
- 2.4.41 Individually the sites /habitats from Ickenham High Road to Harvil Road support populations of local/parish or district/borough interest. Mad Field Covert, the PRoW alongside Highway Farm, and land to the south-east of Breakspear Road South support invertebrate assemblages of district/borough interest due to the range of invertebrates supported including some protected / notable species. Additional areas which were not accessible for survey including further hedgerows and field margins in agricultural land and another small woodland, Newyears Green Covert, are anticipated to support similar invertebrate assemblages. Collectively the habitat features which provide movement corridors at a landscape scale; the River Pinn, hedgerows, the vegetation along the railway and the PRoW alongside Highway Farm support an invertebrate assemblages of conservation interest. This is due to the diverse range of habitats which are in close proximity and link to form one overall invertebrate community.
- 2.4.42 South Ruislip Shaft Vent Shaft Location is assumed to support an invertebrate assemblage of conservation interest, due to the mosaic of habitats recorded at the brownfield site from, PRoW during scoping surveys. The habitats, comprising extensive stands of species-rich ephemeral vegetation on crushed brick and concrete substrates, occurring in a mosaic with scrub, qualifies as the habitat of principal importance type open mosaic habitats on previously developed land. These habitats are known to support a high diversity of invertebrate species, including species of conservation interest. Due to lack of access it is assumed this area may support species of conservation interest.
- 2.4.43 Fields to the south-east of Bayhurst Wood are presumed to support an invertebrate assemblage of conservation interest, due to the proximity to Bayhurst Wood (part of Ruislip Woods SSSI and an ancient woodland) which is known for its invertebrate interest, including nationally rare<sup>9</sup> and nationally scarce<sup>10</sup> invertebrate species. The agricultural land includes hedgerows, ponds and field margins which will provide both habitat, and corridors for movement, such that the invertebrate assemblage within the wood is likely to be found within the agricultural land. In comparison to the agricultural land surveyed between Breakspear Road South and Harvil Rod, the fields to the south-east of Bayhurst wood are likely to support an invertebrate assemblage of similar or greater interest, due to the proximity of the ancient woodland.

<sup>9</sup> Ruislip Woods SSSI citation accessed at [http://www.sssi.naturalengland.org.uk/special/sssi/details.cfm?sssi\\_id=1003633](http://www.sssi.naturalengland.org.uk/special/sssi/details.cfm?sssi_id=1003633)

<sup>10</sup> Ruislip Woods SSSI citation accessed at [http://www.sssi.naturalengland.org.uk/special/sssi/details.cfm?sssi\\_id=1003633](http://www.sssi.naturalengland.org.uk/special/sssi/details.cfm?sssi_id=1003633)

## 3 Aquatic invertebrates

### 3.1 Introduction

- 3.1.1 This section of the appendix presents details of baseline information relating to aquatic invertebrates that is relevant to the section of the Proposed Scheme that will pass through Community Forum Areas (CFA) 1 - 6 inclusive.

### 3.2 Methodology

- 3.2.1 Details of the standard methodology utilised for aquatic invertebrate survey are provided in Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS).
- 3.2.2 Pre-existing invertebrate data was obtained from Greenspace Information for Greater London (GiGL)<sup>11</sup>.
- 3.2.3 No aquatic invertebrate surveys were undertaken in CFA1 to 6.

### 3.3 Deviations, constraints and limitations

- 3.3.1 Field survey was limited to initial scoping from Public Rights of Way (PrOW) from which some water bodies and watercourses could be viewed and supplemented by aerial photography. The ability to adequately scope survey requirements was also constrained. Surveys for aquatic invertebrates were not undertaken for the River Pinn due to access and health and safety constraints. Table 6 provides a summary of locations at which aquatic invertebrate surveys may have been required. Reedbeds adjacent to the Grand Union Canal at Greenford are also referred to in the Terrestrial Invertebrate section of Appendix EC-004-001.

Table 6: Summary of locations in CFA 1 to 6 inclusive where requirements for aquatic invertebrate survey were identified but no access was available for survey

Site and location	OS centroid grid reference	Description of proposed survey location	CFA	Approximate distance from the Proposed Scheme (m) and orientation
Land south of Carr Road	TQ141842	Reedbed /swamp with scrub, trees, ruderal vegetation, grassland south of an area of allotments on Carr Road and to the north of the Grand Union Canal	5	Adjacent
Pond at Ruislip Golf Course	TQ081869	A pond is present towards the east of the golf course towards the club house. It is not adjacent to PRoW, and so could not be inspected. From aerial photography the pond appears to measure 20m x 10m and appears to have some marginal vegetation but is partially over shaded by at least two adjacent trees, so little further information can be gained from aerial photography. The pond substrate and water quality could not be assessed.	6	Within
Pond at Ruislip Golf	TQ080870	A pond located at the foot of the railway embankment at	6	Within

<sup>11</sup> <http://www.gigl.org.uk/>

Site and location	OS centroid grid reference	Description of proposed survey location	CFA	Approximate distance from the Proposed Scheme (m) and orientation
Course		the western end of the golf course. Access did not permit close inspection, but from a nearby PRoW, it appeared to be a shallow pond, surrounded and shaded by willows, with little emergent or aquatic vegetation. Due to tree cover, little further information can be gained from aerial photography. The pond substrate and water quality could not be assessed.		
Pond at Ruislip Golf Course	TQ074871	A pond is present towards the clubhouse at the east of the golf course. It is not adjacent to PRoW, and so could not be inspected. From aerial photography the pond appears to measure 20m x 10m and appears to have some marginal vegetation but is partially over shaded by at least two adjacent trees, such little further information can be gained from aerial photography. The pond substrate and water quality could not be assessed.	6	Within
River Pinn	TQ073871	The River Pinn is a meandering river approximately 6 m wide and mostly about 0.4 m deep over a generally unconsolidated bed. It has little submerged aquatic vegetation though there are water-crowfoots ( <i>Ranunculus</i> subgenus <i>batrachium</i> species) where the railway crosses the River Pinn; but the banks fringed reed sweet-grass ( <i>Glyceria maxima</i> ) and other species. The banks have trees, some areas of secondary or plantation woodland, scrub, rough but not wet grasslands, and also frequent extensive stands of invasive plants.	6	Within
Ponds at Pharmaceutical Research Facility	TQ069872	There are two ponds at the Pharmaceutical Research Facility both of which hold water and support marginal and aquatic vegetation including rushes ( <i>Juncus</i> sp), sedges ( <i>Carex</i> sp) and have a 100% algal cover. One pond also has willowherb ( <i>Epilobium</i> sp) in the margin vegetation. The ponds are located within areas of amenity grassland. The pond substrate and water quality could not be assessed.	6	Within
Drain running east-west located in fields to the north of Newyears Green Lane	TQ066881	Drain running north-south between arable fields to the north of Newyears Green Land. From aerial photographs there appears to be adjacent vegetation in the form of trees and rough grassland. It is not known if this ditch holds permanent water, but it appears to feed into Newyears Green Bourne. The substrate and water quality could not be assessed.	6	Adjacent
Ponds to the north of St Leonard's Farm	TQ071883	Three ponds are present in agricultural land north of St Leonards Farm. These ponds have not been surveyed. Two small ponds (14 m x 5m, and 25 m x 6 m) are adjacent to hedgerows and partly over-shaded such that little further information can be gained from aerial photography. One further larger water body may be present, measuring some 55x 10m. The pond substrate and water quality could not be assessed.	6	Within



## **3.4 Baseline**

### **CFA1 - 4**

- 3.4.1 No impacts are expected to ponds within CFA1 -4.

### **CFA5**

- 3.4.2 Interpretation of aerial photography and views from the adjacent railway indicate reedbeds adjacent to the Grand Union Canal at Greenford habitats may support invertebrate assemblages of interest and anecdotal evidence from an entomologist advises the reedbeds and ditch systems along with the adjacent woodland, scrub and grassland are known to support invertebrate communities of conservation interest.

### **CFA6**

- 3.4.3 Terrestrial invertebrate surveys recorded a number of species of conservation interest associated with the River Pinn corridor some of which have aquatic larval stages, and the river is likely to support aquatic species of conservation interest.
- 3.4.4 There are no records of aquatic invertebrates for ponds within Ruislip Golf Course and the pharmaceutical research facility which are set within managed landscapes in habitats such as amenity grassland. It is not possible to rule out the presence of aquatic invertebrates of conservation interest.
- 3.4.5 There are no records of aquatic invertebrates for the drain north of Newyears Green Lane and ponds within agricultural land north of St Leonard's Farm and south of Bayhurst Wood. Whilst the ponds are within an intensively managed agricultural setting, there is some surrounding vegetation and it is not possible to rule out the presence of aquatic invertebrates of conservation interest.

## 4 White-clawed crayfish

### 4.1 Introduction

4.1.1 This section of the appendix presents a summary of the baseline data relating to white-clawed crayfish for the section of the Proposed Scheme that will pass through Community Forum Area (CFA) 1 to 6 inclusive.

### 4.2 Methodology

4.2.1 Details of the standard methodology for white-clawed crayfish survey are provided in Technical Note HS2 Ecological Surveys: Field Survey Methods and Standards (FSMS).

4.2.2 Desk study records relating to white-clawed crayfish were obtained from the following sources:

- Greenspace Information for Greater London (GiGL)<sup>12</sup>; and
- Environment Agency.

4.2.3 Table 7 lists the watercourses selected for survey and the survey methods undertaken.

Table 7: Summary of proposed surveys for white-clawed crayfish undertaken within CFA1 to 6 inclusive

Water body/watercourse	Location	Survey method and survey dates			CFA
		Scoping visit	Manual search	Trapping	
Grand Union Canal at Camden	Grand Union Canal at Camden	10 May 2012	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	2
Grand Union Canal at Old Oak Common	Grand Union Canal at Old Oak Common, Ealing	08 June 2012	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	4
Grand Union Canal at Greenford	Grand Union Canal south of Carr Road, Ealing	19 October 2012	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	5
Ickenham Stream	Ickenham Stream, Hillingdon	12 June 2013	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	6
River Pinn	River Pinn, Hillingdon	13 June 2013	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	6
Newyears Green Bourne	Harvil Road, Hillingdon	13 March 2013	Survey scoped out and not undertaken.	Survey scoped out and not undertaken.	6

<sup>12</sup> <http://www.gigl.org.uk/planning/>

## 4.3 Deviations, constraints and limitations

- 4.3.1 There were no limitations to the scoping surveys undertaken which affected the outcome of the survey.

## 4.4 Baseline

Table 8: Rationale for scoping out requirement for further survey of watercourses/water bodies in CFA1 to 6 inclusive

Watercourse/ water body	Location	OS grid reference	Description and rationale for scoping watercourse/water body out of requirement for further survey	CFA
Grand Union Canal at Camden	The stretch of the Grand Union Canal in Camden.	TQ288841	There are no works within the canal, and surveys were screened out on the basis of no expected impacts. The sides of the canal are mostly constructed of concrete or steel sheeting and the canal is a highly modified environment.	2
Grand Union Canal at Old Oak Common	The stretch of the Grand Union Canal at Old Oak Common.	TQ221822	There are no works within the canal, and surveys were screened out on the basis of no expected impacts. The sides of the canal are mostly constructed of concrete or steel sheeting and the canal is a highly modified environment.	4
Grand Union Canal at Greenford	Grand Union Canal south of Carr Road, Ealing	TQ141842	There are no works within the canal, and surveys were screened out on the basis of no expected impacts	5
Yeading Brook	Yeading Brook in Hillingdon.	TQ116851 and TQ102858	There are no works within the canal, and surveys were screened out on the basis of no expected impacts The desk study returned records of signal crayfish within the Yeading Brook.	6
Ickenham Stream	Ickenham Stream, Hillingdon	TQ080869	This stream was not considered to provide suitable habitat for white clawed crayfish during the habitat suitability survey as it is prone to drying out and often choked with vegetation.	6
River Pinn	River Pinn, Hillingdon	TQ073871	Signal crayfish recorded during habitat assessment surveys.	6
Newyears Green Bourne	Harvil Road, Hillingdon	TQ060877	Watercourse is likely to be dry during part of the year and the habitat was considered unsuitable.	6

### CFA1

- 4.4.1 No watercourses or waterbodies were identified in CFA1.

### CFA 2 - 4

- 4.4.2 No watercourses with suitable habitat for white clawed crayfish were identified in CFAs 2-4.

### CFA5

- 4.4.3 There are no impacts expected on the Grand Union Canal in CFA5 and therefore further survey was screened out.

### CFA6

- 4.4.4 Signal crayfish have been recorded or reported from the River Pinn and the Yeading Brook, such that white-clawed are considered absent from these watercourses. The Ickenham Stream and Newyears Green Bourne do not have habitat suitable for white-clawed crayfish.

## **5 Fish**

### **5.1 Introduction**

- 5.1.1 This section of the appendix presents details of the baseline information relating to fish for the section of the Proposed Scheme that will pass through Community Forum Area (CFA) 1 to 6 inclusive.

### **5.2 Methodology**

- 5.2.1 No fish surveys were undertaken in CFAs1-6 as no impacts on the watercourses were expected.

### **5.3 Baseline**

- 5.3.1 The watercourses in the section of the Proposed Scheme that pass through CFA 1 to CFA6 include the Grand Union Canal, the River Brent, the Yeading Brook, the River Pinn, the Ickenham Stream and Newyears Green Bourne. None of these watercourses will be impacted by the proposed scheme and so fish surveys were scoped out.

## 6 References

Colin Plant Associates, 2006 (pers. comm.)

English Nature (2005) now available on the web site of their successor organisation, Natural England

[http://www.cieem.net/data/files/Resource\\_Library/Technical\\_Guidance\\_Series/SoSM/Colin\\_Plant\\_-\\_Invertebrates.pdf](http://www.cieem.net/data/files/Resource_Library/Technical_Guidance_Series/SoSM/Colin_Plant_-_Invertebrates.pdf) first accessed in July 2013.

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